

What is claimed is:

1. In a telecommunications network incorporating a plurality of call carrier billing entities, a method of gathering and converting multiple independent billable segments of a telephone call into corresponding billing components for communication to a designated call owner in a manner enabling the call owner to effect billing immediately upon termination of the telephone call and prior to network generation of billing component Call Detail Records (CDRs), comprising the steps of:

providing a telecommunications network covering a plurality of geographical regions, wherein each geographical region is subdivided into a plurality of Local Access Transport Areas (LATAs), each LATA is subdivided into a plurality of Number Plan Areas (NPAs), each NPA controls a plurality of NXX exchanges, and each NXX exchange controls a plurality of Central Office (CO) switches;

integrating a parallel-distributed computer system into the telecommunications network to define a plurality of concurrently operating independent nodes distributed throughout the telecommunications network in a hierarchical arrangement comprising tiered groups of nodes within the network, a first tier group of said nodes strategically located within the network to monitor and control local call traffic within the NPAs, a second tier group of nodes strategically located within the network to monitor and control local long distance traffic within a LATA or a geographical region having multiple LATAs, and a third tier group of nodes strategically located within the network to monitor and control long-distance and international call traffic;

receiving a telephone call transaction request within the telecommunications network at a first node within said first tier group, the transaction request defining a first telephone number identifying a call origination point and a second telephone number identifying a call destination point;

receiving a vector call trajectory at said first node from the telecommunications network, the vector call trajectory comprising a plurality of vector segments defining a switch-to-switch pathway of said call between said call origination and destination points;

converting the vector call trajectory into a corresponding node-to-node billing trajectory bitmap;

identifying, at each node of said billing trajectory bitmap, which of the plurality of call carrier billing entities within a call billing segment associated with the node are being used and the associated call carrier costs;

alerting each of the nodes along the billing trajectory bitmap to generate a respective billable call segment for communication to a subsequently assigned call owner immediately upon receipt of a telephone call disconnect notification;

establishing ownership of the telephone call, at said first node, among said first, second and third tier groups;

assigning ownership of the call to a call owner node within one of said first, second and third tier groups;

receiving notification at the first node that the telephone call has disconnected;  
and

merging the individual billing components at said assigned call owner node.

2. A method as recited in claim 1, further comprising, after the step of receiving a telephone call transaction request, the step of determining at said first node whether the call transaction comprises a billable connected call.

3. A method as recited in claim 1, further comprising, after the step of receiving notification at the first node that the telephone call has disconnected, the step of receiving acceptance of call ownership from the assigned call owner node.

4. A method as recited in claim 3, wherein the step of receiving notification at the first node that the telephone call has disconnected further comprises the call owner node transmitting a message to the informed nodes along the billing trajectory bitmap, the message including an unique system identifier corresponding to the telephone call transaction.

5. A method as recited in claim 4, wherein one or more Call Detail Records (CDRs) reflecting the actual costs of the billable call segments are generated by the network, the method further comprising, after the step of informing, the steps of:

comparing the billable call segments communicated to the assigned owner with said CDRs; and

communicating a confirmation message to the assigned owner node confirming the accuracy of said billable call segments, the confirmation message including said unique system identifier.

6. A method as recited in claim 5, wherein the step of comparing the billable call segments further comprises identifying a cost differential between a billable segment cost communicated to said assigned owner node and a corresponding billable segment cost contained in said CDR, the method further comprising the steps of:

recalculating the billable call segment cost; and

communicating the recalculated billable call segment cost to the call owner node.

7. A method as recited in claim 1, wherein the step of establishing ownership further comprises comparing the call destination point phone number to information contained in a look-up table maintained at said first node.

8. A method as recited in claim 7, wherein the step of establishing ownership further comprises assigning local telephone calls to said first tier group of nodes.

9. A method as recited in claim 7, wherein the step of establishing ownership further comprises assigning local long-distance telephone calls to said second tier group of nodes.

10. A method as recited in claim 7, wherein the step of establishing further comprises assigning long-distance and international telephone calls to said third tier group of nodes.

11. A method as recited in claim 1, further comprising, after the step of

receiving notification at the first node that the call has disconnected, the step of assigning a unique system number, by each call owner node to each call, wherein the first several digits of the system number represent the hierarchical position of the respective call owner node within the system, and the remaining digits comprise a unique sequential number of the call owner node.